DOCUMENT RESUME

ED 383 656 SP 035 996

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TITLE An Evaluation of Field Experiences for the Preparation of Elementary Teachers for Science, Mathematics, and Technology.
PUB DATE Nov 94
NOTE 9p.; Paper presented at the Annual Meeting of the Mid-South Educational Research Association (Nashville, TN, November 9-11, 1994).
PUB TYPE Reports - Research/Technical (143) -- Speeches/Conference Papers (150)

EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS Alternative Teacher Certification; Elementary Education; *Field Experience Programs; Higher Education; Mathematics Education; Methods Courses; Preservice Teacher Education; Program Effectiveness; Program Improvement; Science Education; *Self Efficacy; Student Teachers; Teacher Attitudes; Technology Education
IDENTIFIERS *Preservice Teachers

ABSTRACT

The purpose of this study was to evaluate the degree of self-efficacy preservice teachers developed as a result of participating in field experiences, types of field experiences that were the most beneficial for the professional development of the preservice teachers, and the degree to which pre-stated outcomes were addressed by the field experiences. Data were collected through two surveys (the Science Teacher Efficacy Belief Inventory (STEBI) Form B and the Field Experience Evaluation Form (FEEF)) administered to elementary preservice teachers enrolled in an innovative certification program. Personal interviews were also conducted and analyzed using comparative analysis techniques. Results of the study indicated: (1) the self-efficacy of preservice teachers increased with field experiences that were clearly defined, logically sequenced with a pattern of slow introduction into the clinical sites, and planned for and practiced before implementation; and (2) field experiences that allowed the preservice teacher to participate in small teams were found to be more beneficial to the professional development of the preservice teachers. Results of the interviews were congruent with the FEEF results. Club activities and the classroom team presentations were identified as the field experience activities which were most beneficial to the professional development of the preservice teachers because they allowed them to spend time in the classroom setting and to practice developing lesson plans and presenting the lesson. Contains seven references. (JB)

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# AN EVALUATION OF FIELD EXPERIENCES FOR THE PREPARATION OF ELEMENTARY TEACHERS FOR SCIENCE, MATHEMATICS, AND TECHNOLOGY.

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ED 383 656

## ABSTRACT

The purpose of this study was to evaluate the degree of self-efficacy preservice teachers developed as a result of participating in field experiences, what types of field experiences were the most beneficial for the professional development of the preservice teachers, and how well prestated outcomes were addressed by the field experiences. Data were collected by use of three instruments; the Science Teacher Efficacy Belief Inventory (STEBI), the Field Experience Evaluation Form (FEEF), and personal interviews. The STEBI was analyzed by using the Friedman nonparametric Two-way ANOVA for significance. The FEEF was analyzed using frequency distributions. The personal interviews were analyzed using comparative analyses techniques. Results of this study have produced two significant findings. First, the self-efficacy of preservice teachers increases with field experiences that are clearly defined, logically sequenced with a pattern of slow introduction into the clinical sites, and are planned for and practiced before implementation. And second, field experiences which allowed the preservice teacher to participate in small teams were found to be more beneficial to the professional development of the preservice teachers.

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An Evaluation of Field Experiences for the Preparation of Elementary Teachers for Science, Mathematics, and Technology

## Purpose of the Study

The purpose of this study was to examine the field experiences which were part of an innovative preservice elementary education certification program which had a focus on science, mathematics, and technology. This innovative teacher certification program was designed to respond to national concerns about the quality of teacher education programs and the need to better prepare students in the areas of science, mathematics, and technology. More specifically, this study evaluated the degree of self-efficacy the preservice teacher developed as a result of participating in the field experiences, what types of field experiences were the most beneficial for the professional development of the preservice teachers, and how well the prestated outcomes for the field experiences were addressed by the field experiences.

## Significance of the Study

Researchers have identified an apparent relationship between teacher self-efficacy, teacher performance, and student achievement (Ashton, 1984; Hampton, 1991). It has been found that the higher the level of induced self-efficacy, the higher the performance accomplishments (Bandura, 1982; Ashton, 1984).

A teacher's low self-efficacy toward teaching elementary sciences may result in reduced quality of science instruction or the avoidance of teaching science all together (Riggs, 1988). It has also been reported that elementary science teachers that have a

negative attitude towards teaching often transfer those feelings into their first teaching assignment (Hampton, 1991).

There appears to be a common understanding among today's educators concerning the need to develop positive attitudes toward math and science in elementary school teachers as a means of creating effective and satisfactory elementary programs (Ginns & Foster, 1983). It has been reported that teachers who possess positive attitudes about science and the teaching of science in their classroom cultivate similar attitudes among their students (Weaver, Hounshell, & Coble, 1979).

Ginns and Foster (1983) report "the long term development of positive attitudes to science should commence in preservice content and methodology courses" (p. 277). Gabel, Rubba, & Franz (1977) maintain that enabling preservice teachers to develop a positive attitude toward science and science teaching is a desirable outcome of any science course.

Certainly there are several factors to consider when planning for suitable course work for preservice elementary teachers. When trying to improve attitudes towards science and mathematics and the teaching of science and mathematics, one suggestion is that the course work contain suitable hands-on activities and utilize an inquiry strategy for teaching (Ginns & Foster, 1983).

Another method of improving attitudes of preservice teachers towards science and the teaching of science is including early science teaching field experiences during

the preservice program. In a recent research report which expands on the premise that early field experiences do have an effect on the preservice teachers' science self-efficacy, conclusions indicated that the additional component of cooperative learning experiences upon the group of preservice teachers has a positive influence on their science teaching self-efficacy (Cannon, 1992).

If teacher education programs are to succeed in producing quality teachers who are prepared through training and experience to deal effectively with today's complex and dynamic classroom, the inclusion of comprehensive field experiences should be a critical component. The information produced by this study may be of value to any preservice teacher certification program that is considering reform, and the findings of this study may also be of interest to curriculum developers in teacher certification programs.

## Design and Procedures

This was a qualitative study, and the data presented were classified as descriptive. This study involved the evaluation of the field experience component of an innovative preservice elementary teacher certification program at a midwestern university. The field experiences were part of a series of educational methodology courses which the preservice teachers were required to complete.

Data were collected from the elementary preservice teachers enrolled in the innovative certification program by use of three different instruments: (a) the Science Teacher Efficacy Belief Inventory (STEBI) Form B, (b) the Field Experience Evaluation

Form (FEEF), and (c) personal interviews. The STEBI Form B was analyzed by using the Friedman nonparametric Two-way ANOVA for significance. The FEEF was analyzed using frequency distributions which were supported by additional outcomes addressed and comments identified for each individual field experience. The personal interviews were analyzed using comparative analyses techniques.

## Results

Results of this study have produced the following two significant findings: (a) the self-efficacy of preservice teachers increases with field experiences that are clearly defined, logically sequenced with a pattern of slow introduction into the clinical sites, and planned for and practiced before implementation; and (b) field experiences which allowed the preservice teacher to participate in small teams (of 2-3) were found to be more beneficial to the professional development of the preservice teachers.

More specifically, the results of the STEBI Form B (PESCALE) analysis indicate that a significant change ($p \leq 0.001$) in the preservice teachers' self-efficacy did occur after participation in field experiences at the clinical sites. It is interesting to note that all cases that were analyzed showed an improvement in self-efficacy scores.

The FEEF asked the respondents to evaluate each of the different field experiences according to the prestated outcomes of the field experiences which were established by the innovative certification program. The field experiences that received the highest rating of addressing the prestated outcomes of the certification program were the club activities and classroom presentations.

The results of the personal interviews were congruent with the FEEF results. The club activities and the classroom team presentations were identified as the field experience activities which were the most beneficial to the professional development of the preservice teachers. These activities were identified as being beneficial to the professional developmental of the preservice teachers because they allowed the preservice teachers (a) to spend time in the classroom setting and thus allowed for the development of confidence among the preservice teachers, and (b) to practice developing lesson plans and presenting the lesson to the elementary students.

## Conclusions

The purpose of this study was to evaluate the field experiences of an innovative teacher certification program for elementary science, mathematics, and technology. The data collected provided information that will enable professionals in teacher education certification programs, staff development, and curriculum development to better prepare preservice teachers with the skills and knowledge base needed to function effectively in the classroom.

More research is needed on the value of specific types of field experiences such as the teacher observation/case studies and professional conferences. Support is need from curriculum development specialist to improve the nature of the educational methods course work.

Efforts are needed to assure the collaboration of the public schools and the universities so there can continue to be progress in the development of both

preservice and inservice teachers alike in the teaching areas of elementary science, mathematics, and technology. Preservice and inservice educational workshops, seminars, professional conferences, and journals as well as provisions for opportunities for sharing among professional educators can provide teachers with the support needed for continued program improvements.

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